

# THEORETICAL PERSPECTIVES ON E-CONTENT DEVELOPMENT

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**Abstract:** ICT is influencing every field. Education system can be modified continuously with support of ICT. The e-learning is a subfield of ICT. The e-content of education is a production subfield of e-learning. On modern days, e-content is a highly wanted field for delivering subject content in education field. Some commercial companies produce the e-content module in all the standards of school students. It is nowadays available in the market place. But society frequently raises some questions on the production of the quality of appropriate e-content in a particular standard student because of the vision of such companies have on the economic development of themselves. So, every teacher must produce an e-content for his/her students' learning. Education is not generalized to all. It is specific to everyone. The subject teacher knows very well his/her students' learning potentials, strengths and weaknesses. He/she can only produce the e-content for his/her class students but not likely others. The e-content follows or creates based on some theories. This article analyses theories on the basis of e-content production in an effective way of learning of students. It aims to be correctly guided by e-content producers who know the theoretical background of production of e-content before doing it.

**Keywords:** E-Content, Development, Theories, Behaviorisms, Multimedia, Effective Teaching

## 1. LEARNING THEORIES

Learning can be measured from modified or newly changed from the observable behaviour of students. If, however learning can be occurred intentional or unintentional, behaviour will be occur visibly with environmental interaction. Three types of learning theories are Behaviourism, Cognitivism and Constructivism

## 2. BEHAVIOURISM

Behaviourism is related to stimulus and response. Right stimulus stimulates to get right response. No stimulus can make never occurring response. So, stimulus is a motivating response. New behaviour can establish from S-R connection.

a) CLASSICAL CONDITIONING THEORY OF PAVLOV (1849-1936)

Natural stimulus can be exchanged by the artificial stimulus and also this artificial stimulus creates the natural responses.

TRIAL AND ERROR LEARNING OF EDWARD LEE THORNDIKE (1874-1949)

According to him, three laws were discovered; these laws are law of readiness, law of exercise and law of effect.

LAW OF READINESS

Law of readiness explains learning is depending upon learner's readiness to act. Action facilitates the strengthening of the bond between stimulus and response. One is prepared to learn, learning can be automatically instilled in him/her.

LAW OF EXERCISE

Law of exercise describes drill and practice can be enhancing students' leaning and its outputs. This repetition of action increases the memory level that means decreasing the forgotten that means long term memory working is possible in this drill and practice.

LAW OF EFFECT

Law of exercise describes the trial and error method but not without the interruption of any annoyance or pain. Then only it can make a perfect learning and can attain its goals. Repetition of trial and error action can enhance the learning action without hesitation and voluntary involvement in future action. Trial and error is a strong bond of S-R connection.

b) OPERANT CONDITIONING OF BURRHUS FREDERIC (B.F) SKINNER (1904-1990)

B.F. skinneradvocates stimulus and response bond with reinforcement. Learning must enhance through reward or award but not through punishment or degradation. This is also called the reinforcement theory.

c) INSIGHT LEARNING OF WOLFGANG KOHLER-1925

The theory showed the whole of thing is very essential for learning rather than part of the whole. Exploratory, purposive and creative learning must be the efforts for human activity, it also rejected the trial and error, hit and miss, strive and succeed learning. Learning depends upon intelligence of self. Insight learning with previous experiences can solve the life problems.

d) THE GESTALT THEORY (GESTALTISM)

THE LAW OF SIMPLICITY

Representation of simple diagram or picture in whole is more effective than representation of part of the whole. Human brain easily understands to mean the whole but not part of whole.

e) DRIVE REDUCTION THEORY OF CLARK HULL (1943)

An internal and instinctual process that moves individuals to take actions that would allow them to attain their desired goal or end-state.

### 3. COGNITIVISM

One of the cognitive theorists was Jean Piaget, who advocated that cognitive development of children has beenclassified into four stages such as Sensorimotor stage: birth to 2 years, [Preoperational stage](#): ages 2 to 7, Concrete operational stage: ages 7 to 11, Formal operational stage: ages 12 and up. Simple to complex, concrete to abstract and specific to general principal are the procedural steps for human brain development. All the psychologists have argued that learning was a mental process rather than a behavioural modification. Cognitive development depended upon brain processing such as thinking, imagination, problem solving, logical reasoning, information processing, language, concept formation, observation, interpretation, perception, categorization, differentiation, attention, organization, forming generalization, individual uniqueness identification process etc. Cognitive theory has moved to the forefront of current learning theories (Bednar et al., 1991).There was a shift from a behavioral orientation (where the emphasis is on promoting a student's overt performance by the manipulation of stimulus material) to a cognitive orientation (where the emphasis is on promoting mental processing) has initiated a similar shift from procedures for manipulating the materials to be presented by an instructional system to procedures for directing student processing and interaction with the instructional design system (Merrill, Kowalis, & Wilson, 1981).



### 4. CONSTRUCTIVISM

Constructivism is an educational theory developed by Seymour Papert based on the Jean Piaget's concept, construction of knowledge of individual about things or human being or non-human being through interaction between his/her own experiences, ideas conceived in to mind and knowledge of world. Individual difference influences on construction of knowledge. It is changed from the person to person. Children gain knowledge through explorations, active learning and hands on materials. Students learn by fitting new information together with what they already know. Constructivists believe that learning is affected by the context in which an idea is taught as well as by students' beliefs



## 5. SENSORY STIMULATION THEORY OF LAIRD, 1985

Laird has explored the theory from his research which found that majority of knowledge is being received through seeing that is 75%; next, hearing sense involves knowledge gaining is 13% and remaining three senses namely smell, taste and touch involve knowledge gaining is 12%. Visualization is a top priority to receive the knowledge of individual from the environment.

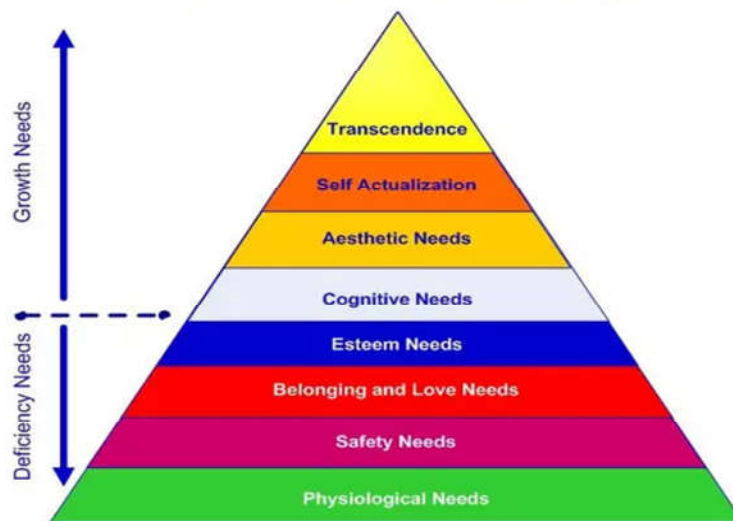
## 6. SENSE OF SIGHT

Educational Technology Basic And Applications of Sampath,K. et al (2008) explains that the knowledge is received through seeing that is 83%; the knowledge which is gained through hearing that is 11%; the knowledge which is gained through smelling that is 3.5%; the knowledge which is gained through touching that is 1.5 %and the knowledge which is gained through tasting that is 1.0%. Visualization is a top priority to receive the knowledge of individual from the environment.

## 6. HIERARCHY OF NEEDS OF ABRAHAM MASLOW'S, 1987

The theory advocated towards the human behavior is being determined by childhood events. It explains need to act as a driver for learning. It is a five tiers model of human needs. Later it is expanded into eight tiers models of human needs.

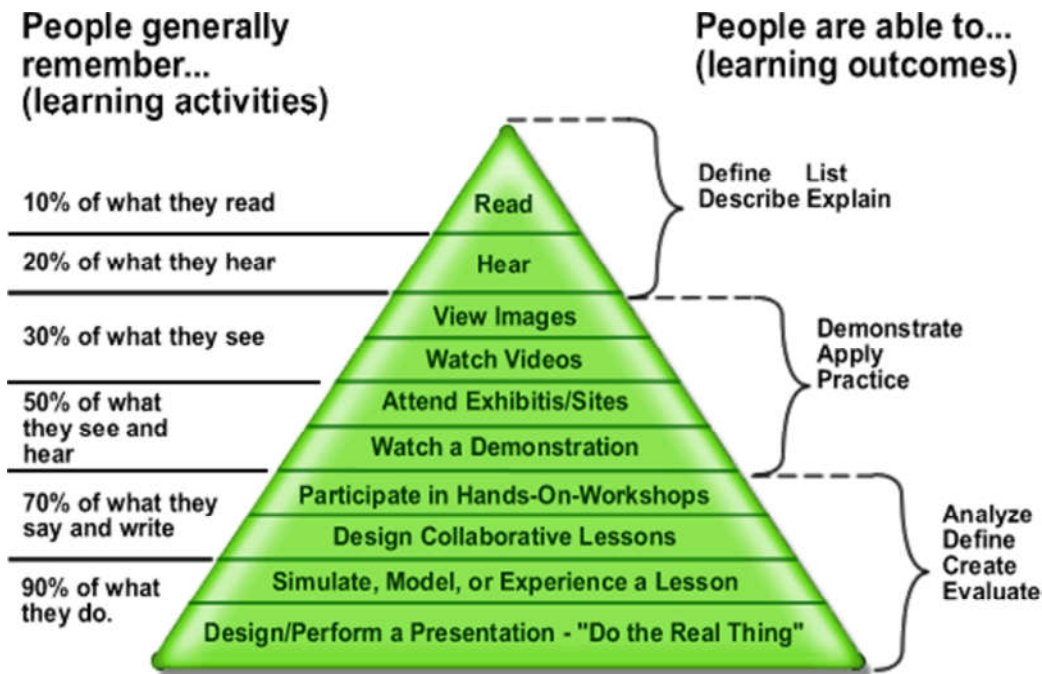
**MASLOW'S MOTIVATION MODEL**



## 7. CONE OF EXPERIENCE OF EDGAR DALE, 1946

Pictorial representation is influencing the learning of students. But it may be influenced in a hierarchical order. Such an order is being arranged from reading to direct purposeful experiences and it is begun from top to bottom. Top represents a tiny experience, bottom represents a huge experience and all others are arranged in the middle of them.

Student gets 10% experiences from reading; 20% experiences from hearing; 30% experiences from seeing; 50% experiences from seeing and hearing; 70% experiences from writing and say; 90% experiences from doing.



### 8. THEORY OF LEARNING- CONFUCIUS

If I hear, I will forget; if I see, I will remember; if I do, I will understand.

### 9. MEMORY AND RETENTION IN LEARNING

Information and material is encoded, stored and retrieved in the brain. These three combinational processes are called memory. Memory is a property of the central nervous system. There is a three type of memory which can be classified such as short-term memory, long-term memory and sensory memory.

Long term memory is an essential one for the real life problem solving ability of human action. Any learning can be stored up in long term memory system in the brain. Without human memory processes, retention of material or information is impossible. Learning depends upon memory process because newly learned information is identified or recognized from already stored up knowledge. Human memory stores and retains the informations through active learning, repetition and recalling. Information in memory store is shortly forgotten through some causes such as inefficient encoding of material, decay of information, interference, competition of newly learned material and retrieval failure. If the stored up material is regularly retrieved and recalled, the memory and retention will be functioning in an effective way for the engagement of learning. Information is being retained in long term memory through repetition, chunking and recollection.

### 10. COMMUNICATION THEORY OF CHARLES E. OSGOOD'S MODEL- 1954

It explained that communication is a dynamic process when a healthy interactive association exists between the source (teacher) and the receiver (students).

Interactive communication is an exchange of ideas where both participants, whether human, machine and art form is active and can have an effect on one another. It is a dynamic, two-way flow of information.

Interactive communication forms include basic dialogue and nonverbal communication, game-books, interactive fiction and storytelling, hypertext, interactive television and movies, photo and video manipulation, video sharing, video games, social media, user-generated content, interactive marketing and public relations, augmented reality, ambient intelligence, and virtual reality.

### 11. THEORY OF LEARNING STYLE – Neil Fleming and Mills (1992)

The acronym VARK stands for Visual, Aural, Read/write, and Kinesthetic sensory modalities that are used for learning information. They suggested four modalities that seemed to

reflect the experiences of the students and teachers.

(i) VISUAL LEARNING STYLE

Students more easily learn the new concepts from the visual forms. It means they are easily grasping the concept in their mind with the capture of the visual representation rather than other form of representations. So the information are being presented through maps, diagrams, pictures, charts, graphs, flowcharts, using block board, white board, smart board, directional pictures, symbols, labeled diagrams, all symbolic arrow, circles, hierarchies, simulation models, real objects, colours, size, brightness, films, movies, photo pictures and etc. pleasurable learning occur through seeing of eyes rather than hearing, touching, smelling, tasting.

(ii) AUDITORY/AURAL LEARNING STYLE

Students more likely learn the new concept from the auditory form. It means they are easily grasping the concept in their mind with the capture of the sound rather than other form of representations. They more like over hearing and patient listening. So the information are presented through speeches, lectures, audio forms, group discussion, live chat with speaking, cell phone speaking, peer group interaction with voice, two way video conferencing, commentary, compeering, seminars, conferencing, panel discussions, sing the songs, using radio, television, computer with sound effect, webcam interaction, sound recorded content and speech, scientist speech, special lecture, video lecture, Prime minister's speech, chief minister's speech, minister speech and leader speeches, debates etc. pleasurable learning occurs through hearing of ears rather than seeing, touching, smelling, tasting.

(iii) READING/ WRITING LEARNING STYLE

Students mostly liketo learn the new concepts from the reading or writing forms. It means they are easily absorb the concepts in their mind and retaining stored up matter with the capture of reading /writing materials rather than other forms of representation. They do a lot of work over reading in library and writing notes. So the information are being presented through speeches in text, lectures in text, text chats, emails, letters, cell phone messages, printing materials, text books, story reading, articles reading. Conference proceedings, G.O proceedings, projects in word forms, notes reading, newspaper and magazine reading, periodical publishing in text, essay in text, language patterns and grammars, written formats, online reading, verbal reading, sign reading, archaeological reading, quotations, manuals, instructional text, dictionaries, periodical reviews, article writing, story writing, type writing materials, research writing, criticizing in text form, poetry writing, books writing, manual writing, letter writing, writing literature, lists reading or writing, account book maintenance, communication writing, word charts, test writing, reports, suggestions, taking notes during teachers teaching, chart and diagram reading and etc. pleasurable learning occur through reading or writing rather than smelling, tasting.

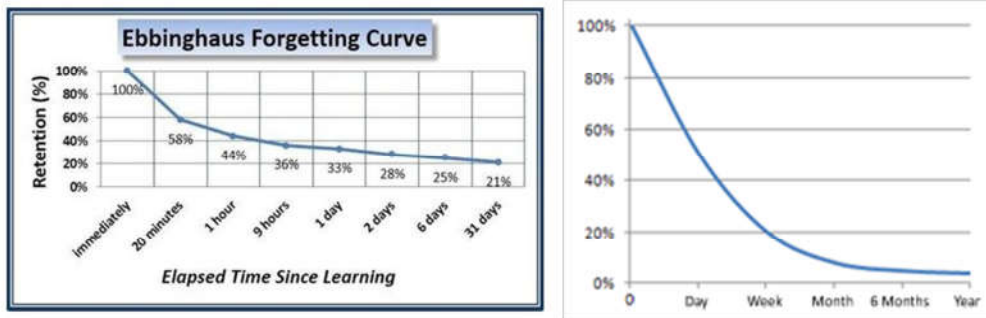
(iv) KINESTHETIC/TACTILE LEARNING STYLE

Students are font of learning the new concepts from the physical activities. It means they are easily absorbing the concepts in their mind and retaining the stored up matter with the capture of the real experiences rather than the other forms of representation. So the information is presented through dancing, swimming, running, sports, type writing, drawing, computer operation, doing sculpture, handicraft, SUPW, games play , hand-eye coordination, touching sense, smelling directly the ingredient or foods, tasting directly the ingredient or some chemicals, tailoring, bouncing, swinging their legs, tapping, wiggling and also may with the doing things, whole body moment activities, creating mini-books, games, skits, models, building block, sand building, art materials, gardening, small project, problem solving, practical classes in laboratory, drama making, demonstrations, simulations, videos, and movies, as well as case studies, practice, and applications and etc. pleasurable learning occur through learning by doing method such as experiences, practices, simulations making or real objects making.

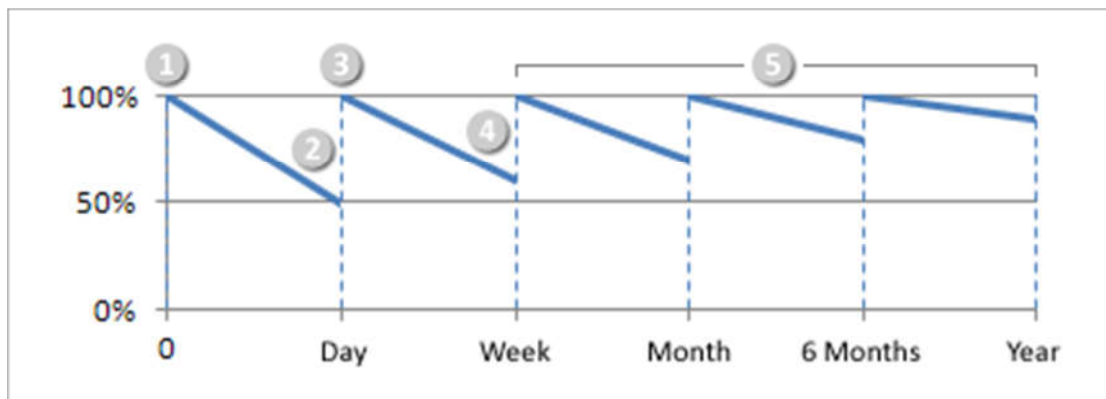
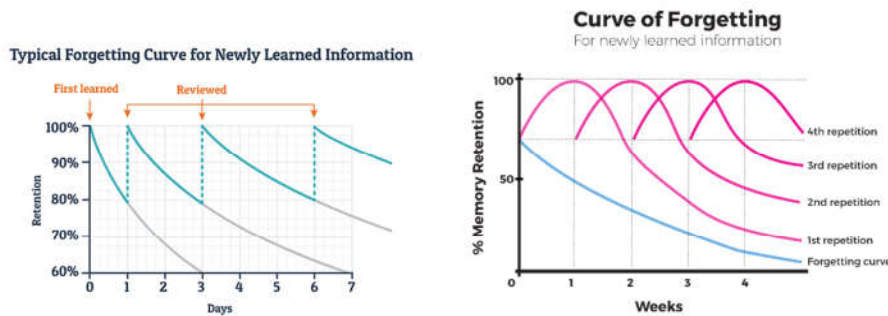
## 12. FORGETTING CURVE OF EBBINGHAUS (1885)

Forgetting or disremembering is the apparent loss or modification of information already encoded and stored up in an individual's [long-term memory](#). New information is learnt in short-term memory and often drills and practices is an essential one for the information stored up into the long-term memory, when the learnt information is forgotten quickly, the repetition will quickly more plays on in one's learning.





Forgetting is a phenomenon of retention of the brain memory which is related to mathematical equations such as  $R = e^{-\frac{t}{s}}$  were found by Rubin, Hinton, and Wenzel (1999). where R refers to memory retention, t refers to time and s refers to relative strength of memory.



The curve starts at the top left. 100% of information is retrieved at the time of learning. A Learner gradually happens to forget the learnt information; he/she remembers only a 50% of information after a day.

So he/she is learning again the same information and 100% of information is retrieved after practicing.

Around 60% of the information is recovered after a week, but the forgetting rate is lower at this time and the learner who remembers it knows better and longer.

The forgetting curve is flat for every review until the moment, when it gets practically straight. More practices with certain interval can be stored up with the information in learner's brain permanently.

- ❖ Rate of Forgetting
- ❖ Various factors can influence on the rate of forgetting. Some of the factors are
- ❖ Meaningless information
- ❖ The way of presentation of information
- ❖ Physiological factors (stress, sleep, etc)

Each person changes the rate of forgetting as compared with others. Herman Ebbinghaus

advocated that difference in memory performance between two different individuals can be explained by mnemonic representation skills.

### **13. DUAL CODING THEORY-ALLAN PAIVIO (1971)**

Better cognition process in the brain of human happens through both verbal and non-verbal (analog or symbolic) combinational representation at the same time without separate representation in unique ways. Reed (2010) supported the theory that the formation of mental image which aids in learning is used by Paivio. Sternberg (2003) supported the theory that when the human beings retrieve the information, they can use both them in visual and verbal codes alike.

### **14. MULTIMODE MODEL OF ATTENTION OF JOHNSTON AND HEINZ (1978)**

Physical inputs or Semantic inputs both makes attention. Attention is dependent upon the one's needs at the time. Semantic selection of attention is a greater emphasis than physical selection of attention.

### **15. CAPACITY MODEL OF ATTENTION OF DANIEL KAHNREMAN (1973)**

Mental effort or energy is an essential one for attention of one. Anyone who is involved in a mental task in his/her performance requires mental effort.

### **16. ATTENTION FACTORS**

The two types of Attentionfactors areas follow

#### **EXTERNAL FACTORS**

External factors such as Colour, Shape, Beauty, Oddity, Pictures, Loudness, Brightness, Big Size, Contrast, Location, Repetition, Motion, Definite Form and Isolation are making the attention.

#### **INTERNAL FACTOR**

Internal factors such as Interest, Motives, Past Experiences, Emotion, Habit, Meaning, Aims, Disposition, Temperament, Attitude and Aptitude are making attention.

### **17. HERBATIANISM OF JOHANN FRIEDRICH HERBART (1776–1841)**

Herbart recommended five formal steps in teaching: (1) preparation—new content is prepared on the basis of learners' past experiences. (2) presentation—new content presentation starts with concrete stimuli to abstract one.(3) association— new ideas are being compared with former ideas to identify similarities and differences for the implantation of the new ideas in the learners' mind; (4) generalization—a procedure especially essential to the instruction of learners and designed to develop the wisdom beyond the level of perception and the concrete;(5) application—using the acquired knowledge not in a purely sensible way but so that every learned idea becomes a part of the practical mind and an aid to solve, the vital interpretation of life. The learner immediately applies the new idea, making it his own.

### **18. SUMMARISING THE THEATRICAL PERSPECTIVES FROM ALL ABOVE THEORIES**

The e-learning is a process and the e-content is a product of one among productions of the e-learning. E-content is vastly used in the class room teaching-learning process in modern times. The e-content is a motivating tool for initial learning to the learners and self-learning tools for after getting prior basic knowledge by B.F.Skinner's. Thee-content act as an audio-visual aid is mentioned by Pavlov. Thee-content is a drill and a practice tool for learning for any one at any time is mentioned by E.L.Thorndike. Thee-content is a creation of insight learning in mental images coin with suitable word and complex problem solving through this internal process of mental power at the moment of critical situation met or based needs and heuristic method of teaching makes general rules and principle by using insight learning by Wolfgang Kohler. Thee-Content is a creative tool because part of the picture presentation is taken from whole picture presentation by theGestaltism. The e-Content is a tool to enhance the internal mental process such as imagination, thinking, information processing etc. by a cognitivist. The e-content is a tool for creating own experiences, thoughts and ideas conceive in

his/her own mind by a constructivist. E-content creation is based upon using more than one senses by Sensory Stimulation Theory- Laird, 1985, Sense of Sight, Hierarchy of Needs- Abraham Maslow's, 1987, Cone of Experience- Edgar Dale, 1946, Theory of Learning- Confucius, Theory of Learning Style – Neil Fleming and Mills (1992), Communication Model of Charles e. Osgood- 1954, Dual Coding Theory-Allan Paivio (1971), Attention Factors. The e-content is a tool for long-term memory and retaining capacity enhancement with often refreshing the knowledge through repetition within a particular duration. The e-content has fully the meaningful content delivery module, effective multimedia presentation and reducing the psychological learning barrier factors by Memory and Retention in Learning and Forgetting Curve of Ebbinghaus (1885). The e-content is formulated with mingling both hearing form and visual forms by Dual Coding Theory-Allan Paivio (1971).

The e-content development with multimedia presentation is inserting such qualities for attention of students towards the contents such as various colour modification, clear letter presentation, size modification, still pictures, 2D and 3D simulated models, insert animation, video, moving pictures, rhythms of sounds, turning colour contrast, voice presentation, important content places in middle and topic places on top in the screen or slide. More repetitions are possible without any hesitation, tiredness and changes after careful development at any time, at any place for anyone. The e-content is a well planed content with certain principles, e-content creates interest, motives, positive attitude; enhance aptitude with attaining certain goals or high performance, past experiences stimulates knowledge, understanding, applications and skills of present content. The e-content has some objectives based on creation and make harmful, peaceful, joyful, emotional and sensational stability with motivation during the content learning in self or with group, less temperament and motivated disposition making tool with harmonious environment by Multimode Model of Attention and Capacity Model of Attention Of Daniel Kahnreman (1973). Steps of teaching or learning of e-content is designed by the creators based upon Herbartianism.

Therefore, the e-content development for up lifting the learning of students is the chief aim of educational practices. Learning must be enhanced through joyful, enthusiastic way e-content preparation considered to design without blindness but with some theatrical perception is essential for effective preparation and presentation.

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